

CO2 Storage Monitoring: 4D Seismic Improvements Using Precision Impulse Technology

CO2 Storage – CO2EOR – MER

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Precision Impulse



ILLUMINATING THE SUBSURFACE: PI SEISMIC SOURCE IN ACTION

*Precise and repeatable impulsive force
generated by patented instantaneous detonation
of a fuel/air mixture*

1,600 kg reaction mass

1,675 kg total mass



HOW DOES DATA COMPARE TO POWERFUL VIBROSEIS?



At a fraction of the Renegade's size and weight, the PI seismic source is more powerful and more reliable.

ONSITE TEST FOR PDO IN OMAN

Inova AHV-IV Renegade vibroseis vs. Precision Impulse into 25 x 10 km spread

✓ Excellent results presented at SEG workshop in November 2019 leading to second R&D funding contract



SOCIETY OF EXPLORATION
— GEOPHYSICISTS —



شركة تنمية نفط عُمان
Petroleum Development Oman



TOTAL'S METIS PROJECT

3 R&D funding contracts awarded to develop highly portable land source

✓ Result: 3 successful demonstrations against vibroseis (penetration & endurance)



CO2 Storage Monitoring

A Critical Component in Clean Energy Systems

Seismic 2020

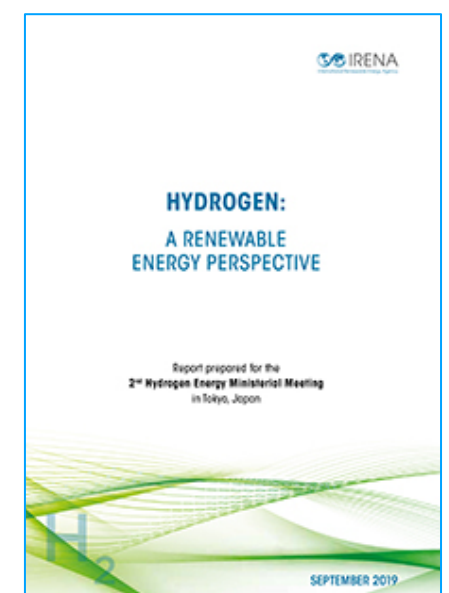
WHY MONITOR?

- Prove to society we are doing what they want
- Build trust and confidence between governments/public and oil and gas
- Provide data required by regulatory and reporting agencies
- Ensure maximisation of capture and storage rates
- Guarantee that remaining emissions are accounted for correctly
- Account for storage efficiency in geological formations—currently the only viable option for storing CO2
- Promote circular economy — monitoring hydrocarbons out / CO2 in

*Experts state that Monitoring, Reporting and Verification (MRV) is key to storage integrity.**

The talent pool required includes geophysicists and geologists as well as specialists in big tech data, AI and HPC. Upgrade our image!

* IRENA, OECD, IEA, etc.





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FULL OCEAN BOTTOM SEISMIC ADVANTAGES



- Near zero environmental impact
- Total safety
- Low cost
- Generates its own energy from precise chemical reaction
- Improved data quality
- Excellent repeatability
- New data — shear as well as compressional
- New acquisition configurations
- Faster processing
- Can better seismic data be used to estimate CO2 saturation?

IMAGE IMPROVEMENT

- Geophysicists and big tech need data to visualize and monitor the subsurface.
- New data acquisition technology is required to verify the solution to the carbon imbalance to all stakeholders.
- Precision Impulse is discussing partnerships and inviting collaboration for demonstration.

Demonstration could be conducted readily and cost-effectively by dropping the source on the seabed from a platform crane and shooting into an existing permanent array of sensors.

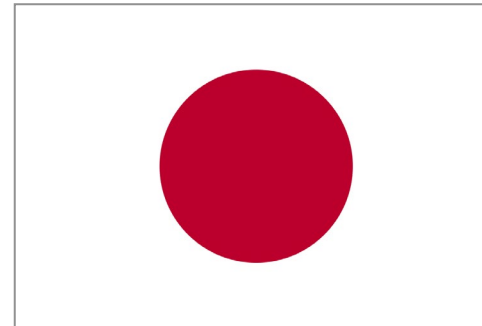


GOVERNMENT SUPPORT

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Seismic 2020



MARCH 2020

Awarded Scotland/Japan/EU major grant to develop seabed seismic source for monitoring CO2 storage

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THANK YOU

